

PRELIMINARY SUGGESTIONS FOR MONITORING
MARTEN ON THE MEDICINE BOW
NATIONAL FOREST

by
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Preliminary Suggestions for Monitoring Marten on the
Medicine Bow National Forest

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21 April, 1987

The marten (Martes americana) is considered an ecological indicator of old-growth conditions in subalpine forests of the Rocky Mountain Region. The impacts of timber harvest and other activities on marten are largely unknown, but these activities could reduce the amount and/or quality of old-growth habitat for marten. Therefore a need exists to monitor marten habitat or population size during the implementation of forest land management plans. Several options exist to satisfy this need: (1) monitor acres of habitat, (2) monitor marten directly, or (3) monitor some index of marten occurrence.

Option 1 is highly desirable because technology is already in place and objectives could be met at little added cost. Unfortunately, data do yet exist linking marten population size and viability to the amounts, kinds, and distribution of habitats.

Option 2, involving some kind of capturing scheme, is highly desirable because population size could be directly estimated. However, the effort required to achieve sufficient numbers of captures for accurate population estimation would be probably expensive if a large area (10^3 acres or greater) is trapped. The possibility exists that, in cooperation with the Wyoming Game and Fish Department, the Forest Service could keep track of fur-trapping success/unit effort as an index to population size. However, the Forest Service would have no control over the geographic distribution of trapping activity. Furthermore, trappers will likely concentrate only on prime habitat, moving to new areas if forest management activities are perceived to reduce habitat quality in the vicinity of favored trapping locations. This movement would lead to a biased estimate of population trends since areas of newly-created poorer habitat would be avoided.

Because Options 1 and 2 are not viable at this time, I propose a third option: counting marten tracks in snow. This option is based on the assumption that numbers of marten tracks per mile searched is directly related to numbers of animals per square mile, that is, that track density is related to marten density. The exact relationship is less important than knowing that, for example, an annual decline in track density is evidence of a decline in marten density. This option is a compromise between options 1 and 2. It is an indirect estimate of marten population size but, because tracks are left by actual animals, counts of tracks are much more easily linked to marten occurrence than counts of acres of habitat. Counting tracks requires orders-of-magnitude less cost than trapping and can be accomplished with a minimum of training.

METHODS AND RESULTS

The following guidelines were developed based upon experience gained over the past winter at the Coon Creek Wildlife Project study area located on the Coon Creek and East Fork Encampment River drainages 15 miles south of Encampment, Wyoming.

Beginning 20 November 1986 we counted marten tracks along certain established roads and trails within the study area. While driving snowmobiles slowly, all tracks were counted which bisected the snowmobile track. Track intercepts were tallied regardless if they were obviously from the same animal wandering down the road. We counted tracks from .5 to 4 days since the last snow event, traveled from 2.8 to 11.7 miles per day, and recorded from 1 to 35 tracks per day. Over all days, we averaged 1.7 track intercepts per mile per day since snow. Excluding the last day (on

which conditions were poor), the average was 1.9 intercepts (Table 1). Among the 4 months we sampled, November was most productive for counting tracks (Fig. 1).

It appears that the best time to count tracks was 2 days after the last snow event. There were usually enough tracks to make the count worthwhile yet the tracks were not deteriorated by wind or melting beyond recognition and identification. Recognition is best accomplished by driving slowly while kneeling. Identification is based upon length and width of track sets, gait, and footprints (Fig. 2). The habitat that marten will traverse was highly variable and should not be used as a criteria for track identification.

Tracks tended to occur in clusters. Some areas e.g., a specific creek or a specific saddle almost always had tracks. Other sections of road up to several hundred yards in length never had tracks.

RECOMMENDATIONS

The following recommendations were derived from our preliminary findings and are offered as a starting point for planning purposes.

1. Counts should be conducted using snowmobiles along snowmobile trails or low-use roads.
2. Conduct counts when fresh snow is present, preferably with 2 days of last snow >1".
3. Conduct counts in November.
4. Counts should cover about 5-10 miles of trail for each area of interest.

5. Ideally, trail routes should be randomly selected each year.

However, logistic problems may require sampling the same routes each year.

6. Track intercepts should be recorded in 1-mile segments along each route to calculate variance of counts.

7. Counts should be conducted by 2-person crews working independently but in radio contact.

8. Crews should receive field training in track identification (which Rocky Mountain Station is willing to provide) prior to start of field work.

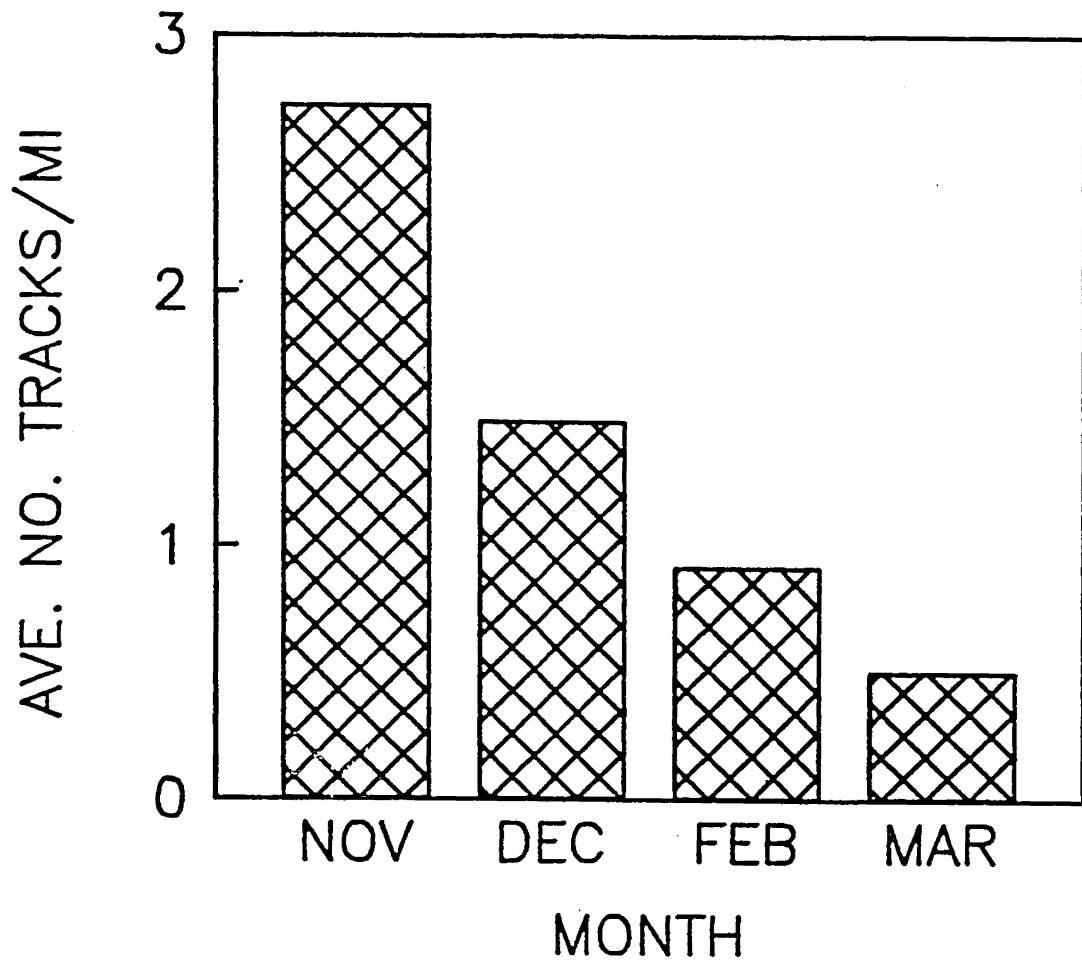
9. Trails and roads should be well-distributed over the area of interest and should cover a variety of timber-types.

10. Results should be evaluated after the first year to determine whether the level of effort is sufficient to detect a decline in track density with an acceptable level of statistical confidence. Rocky Mountain Station will provide such analyses.

Table 1. Results of marten track counts, Coon Creek Wildlife Project,
Sierra Madre range, 1986-87.

Date	No. of track intercepts	No. miles traveled	Days since snow	Tracks/mile/day since snow
20 Nov.	12	6.0	1	2.0
21 Nov.	24	2.8	2	4.3
02 Dec.	18	11.7	2	0.8
10 Dec.	17	3.7	1	4.6
11 Dec.	16	5.1	2	1.6
03 Feb.	35	8.0	3	1.5
04 Feb.	2	2.8	0.5	1.4
24 Feb.	8	8.8	4	0.2
11 Mar.	9	5.1	2	0.9
26 Mar.	1	6.0	1.5	0.1
Mean (all days)				1.74
S.D. (all days)				1.55
Mean (w/o 26 Mar.)				1.92
S.D. (w/o 26 Mar.)				1.53

FIGURE 1.
MARTEN SNOW TRACKING
MONTHLY RESULTS



Members	Front				Hind				Bounding	
	Length in	(cm)	Width in	(cm)	Length in	(cm)	Width in	(cm)	Straddle in	(cm)
Weasels										
Least	$\frac{3}{8}$	(1)	$\frac{1}{2}$ -	(1.3)	$\frac{3}{8}$	(1)	$\frac{1}{2}$ -	(1.3)	$1\frac{1}{2}$	(3.8)
Short-tailed	$\frac{1}{2}$	(1.3)	$\frac{1}{2}$ +	(1.3)	$\frac{1}{2}$	(1.3)	$\frac{1}{2}$	(1.3)	2	(5)
Long-tailed	$\frac{3}{4}$	(1.9)	$\frac{3}{4}$ +	(1.9)	$\frac{3}{4}$	(1.9)	$\frac{3}{4}$ +	(1.9)	$2\frac{1}{2}$	(6.4)
Marten	$1\frac{3}{4}$	(4.4)	$1\frac{3}{4}$ +	(4.4)	$1\frac{3}{4}$	(4.4)	$1\frac{3}{4}$ +	(4.4)	$3\frac{1}{2}$	(23)
Fisher	$2\frac{1}{2}$	(6.4)	$2\frac{1}{2}$ +	(6.4)	$2\frac{1}{2}$	(6.4)	$2\frac{1}{2}$ +	(6.4)	6	(15)
Wolverine	4	(10)	4 +	(10)	4	(10)	4 +	(10)	9	(23)
Ferret	$1\frac{1}{8}$	(2.9)	$1\frac{1}{4}$	(3.2)	$1\frac{1}{8}$	(2.9)	$1\frac{1}{4}$	(3.2)	$2\frac{1}{2}$	(6.4)
Badger	$2\frac{1}{2}$	(6.4)	2 +	(5.1)	2	(5.1)	2	(5.1)	10	(25)
Mink	$1\frac{3}{4}$	(4.4)	$1\frac{3}{4}$ +	(4.4)	$1\frac{3}{4}$	(4.4)	$1\frac{3}{4}$ +	(4.4)	$2\frac{3}{4}$	(7)
Otter	$3\frac{3}{4}$	(9.5)	$3\frac{3}{4}$ +	(9.5)	$3\frac{3}{4}$	(9.5)	$3\frac{3}{4}$ +	(9.5)	9	(23)
Spotted skunk	$\frac{3}{4}$	(2)	1	(2.5)	$1\frac{1}{4}$	(3.2)	1 -	(2.3)	$2\frac{3}{4}$	(7)
Striped skunk	$1\frac{1}{2}$	(3.8)	$1\frac{1}{4}$	(3.2)	$1\frac{1}{8}$	(4.8)	$1\frac{1}{4}$	(3.2)	$3\frac{1}{2}$	(9)

A plus or minus indicates that the track averages slightly larger (+) or smaller (-) than the measurement.



Marten tracks may show either four or five toes in prints. During the winter, dense hair makes the prints appear more robust. Prints are from the Mountain Research Station, Colorado. Scale 2 in (5 cm).

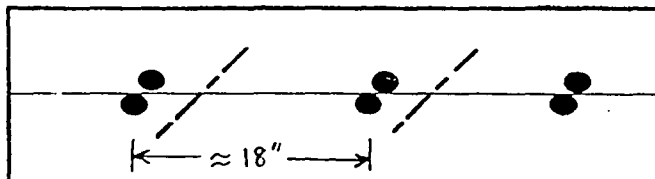


FIGURE 2. CHARACTERISTICS OF MARTEN TRACKS.